October 26, 2001

Express Mail Label No.: ET849028933US

PATENT

UNITED STATES PATENT APPLICATION

of

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for

OSCILLATORY AMUSEMENT RIDE

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to an amusement ride for accelerating and decelerating a participant where the initial force provided for the ride is generated by downward movement of the participant.

DESCRIPTION OF THE RELATED ART

United States patent no. 5,203,744 utilizes the force of a downward moving participant to stretch a resilient band, commonly termed a bungee cord, to provide the power for oscillating a participant.

Additionally, the present inventor created an amusement ride termed RAPID RISER which used a hydraulic system to stretch a resilient band attached to a participant while the participant initially remained on the ground and then lifted the participant with the resilient band. The lifting force produced by the hydraulic system generated the requisite power for then accelerating and decelerating the participant.

The RAPID RISER patent application was serial no. 08/012,358; was filed on February 1, 1993; and resulted in a Notice of Allowance; but the inventor chose not to obtain a patent, even though the RAPID RISER was commercially produced.

Both United States patent no. 5,632,686 and United States patent no. 5,704,841 introduce compressed gas into a bore of a housing to accelerate a piston attached to a cable and thereby accelerate and decelerate a participant. In one mode of operation, the device of United States patent no. 5,704,841 can raise a participant slowly when gas is slowly injected into the bore.

And, in one embodiment, the device of United States patent application serial no. 09/923269, which was filed on August 3, 2001, introduces fluid into a housing to propel a piston connected to a cable to create the initial force to propel a carrier containing one or more participants.

United States patent no. 5,893,802 is very similar to United States patent no. 5,632,686, and United States patent no. 6,001,022 is highly reminiscent of United States patent no. 5,704,841.

Of the preceding, only United States patent no. 5,203,744 simply utilizes the force of a downward moving participant to provide the initial power to oscillate the participant; and it employs resilient bands or bungee cords.

Several patents, *e.g.*, United States patent numbers 5,421,783; 5,649,866; and 5,810,671 have a passenger carrier that is accelerated upward by bungee cords and can relatively freely swing about the ends of such cords. There is, however, no control over any rotation of the carrier that does occur.

United States patent no. 6,083,111 does involve controlled rotation of a passenger chair (also termed a "support") for an amusement ride. The degree of rotation is, however, purposefully limited; the limited rotation that is possible apparently occurs only over a restricted, fixed portion of a course upon a tower; and only downward movement occurs when the chair has been rotated from its initial substantially vertical position.

And United States patent application serial no. 09/922,548, which was filed on August 3, 2001, covers a machine-powered seat for an amusement ride that can rotate through a substantial range.

Finally, the device of United States patent no. 5,593,368 suspends two resilient bands (or bungee cords) from columns and attaches the free ends of the resilient bands to a participant, preferably near the participant's center of gravity. The columns are placed around a trampoline; and as the participant bounces higher, the point of attachment on the columns is automatically raised. Oscillations are produced primarily by bouncing on the trampoline. The resilient bands do, though, permit a participant to rotate through the participant's own power.

SUMMARY OF THE INVENTION

The present invention employs the force of a downward moving participant to provide the initial power to accelerate and decelerate the participant in an oscillatory manner without the need for a resilient band or bungee cord.

A housing, preferably, but not necessarily, a cylindrical housing, having a bore has a piston slidably mounted within the bore. A means, preferably a cable, for transferring force between the piston and a holder for a participant is connected to the piston and to the holder.

In a first embodiment, the force transferring means exits the housing through an aperture in a closed first end of the housing. The housing is capable of retaining a compressed fluid between the closed first end and the piston for at least one oscillation of the piston. A compressible fluid, preferably—but not necessarily—a gas and most preferably—but not necessarily—air, is introduced through a fluid supply valve between the piston and the closed first end of the housing.

A second end of the housing may be either open or closed.

As a participant jumps or falls and thereby allows his or her body to be pulled downward by gravity, the piston is pulled toward the first end of the housing, compressing fluid therein. Eventually the compression of the fluid will stop the downward motion of the housing. Momentum, however, causes the piston to compress the fluid more than is necessary to stop the participant. Therefore, when this momentum is overcome, the fluid is compressed to such an extent that it expands with sufficient force to accelerate the piston away from the first end of the housing and to accelerate the participant upward.

If desired, additional fluid can be introduced into the bore of the housing to cause an even greater acceleration of the participant. If sufficient fluid is introduced, the participant is raised beyond the position from which the participant initially began his or her descent.

Preferably, but not necessarily, an aperture or, preferably, but not necessarily, a valve is in a side of the housing. This aperture or valve communicates with the bore of the housing and with the atmosphere. As the piston approaches the aperture or the valve (when it is open), fluid may escape from the bore, permitting the piston and the participant to accelerate with less resistance. Once the piston has passed the aperture or valve on its path toward the first end of the housing, the piston begins to compress the fluid as described above.

In an alternate embodiment, the cable is continuous. In this embodiment, the cable exits the housing through the aperture in the first end of the housing; re-enters the housing either through the open second end of the housing or, if the second end is closed, through an aperture in the second end; and is attached to the piston. With this embodiment, a first end of a second cable is attached to the cable outside the housing. A second end of this second cable is connected to the holder.

In either embodiment, the housing can either be above or below the position from which the participant initially begins his or her descent. Preferably, but not necessarily, the housing is below this point. In such a case, a means, preferably, but not necessarily, a pulley, is employed to change the direction of force exerted by the piston. In the first embodiment, the cable goes across this pulley; in the second embodiment, the second cable goes across this pulley.

Preferably, but not necessarily, the Oscillatory Amusement Ride utilizes a single holder but two housings, each having all the components described above with respect to the ride, except, as stated, for the holder.

Preferably, but not necessarily, the fluid for each housing is supplied from a common source. A separate line goes to each housing and contains a blocking valve.

In the unlikely event that an uncontrolled leak of fluid should arise in a housing between the piston and the first end of the housing, the retarding force of the fluid would be less; so, the cable would move more rapidly. A sensor is preferably, but not necessarily, employed to indicate the loss of pressure caused by the escaping fluid. Preferably, but not necessarily, this is done by having a sensor that measures the speed of the pulley associated with each housing.

When the pressure difference between the two housings exceeds a predetermined range, a computer or microprocessor in communication with the sensor and with the blocking valves will cause the line to the housing leaking fluid to close so that the non-leaking housing will not lose fluid and will decelerate the participant.

Preferably, but not necessarily, the participant jumps or falls from a movable platform. The platform can be moved by any means that is well known in the art, such as pneumatics, hydraulics, or an electrical or gas-powered motor. If desired, it could be balanced so that it is normally away from the jump position and must be moved into position.

Preferably, but not necessarily, a sensor in communication with the computer or microprocessor detects whether the platform has been moved from the jump position. The computer or microprocessor is in communication with the injection valve and will not allow additional fluid to be injected into a housing until the platform has been moved away from the jump position. This is intended to preclude a participant from being accelerated upward into the platform.

If desired, fluid can be injected slowly into the bore of the housing to raise a participant to the platform prior to the participant's jumping or falling from the platform.

Preferably, but not necessarily, the cable (the second cable, in the case of the optional embodiment) is rotatably attached to the holder.

The holder may be either a harness or a seat.

If the holder is a seat, the center of gravity for the seat is kept a sufficient distance below the point of attachment that the seat will not rotate unless a participant rocks it but is also kept sufficiently close to the point of attachment that a participant can rock the seat and thereby rotate it.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the housing which has a non-continuous cable.

Figure 2 portrays the housing with a continuous cable.

Figure 3 shows the Oscillatory Amusement Ride employing two housings.

Figure 4 exhibits blocking valves in the supply lines for two housings of an Oscillatory Amusement Ride.

Figure 5 depicts a harness.

Figure 6 demonstrates a seat used in one embodiment of the Oscillatory Amusement Ride.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As viewed in Figure 1, the Oscillatory Amusement Ride, in a first embodiment, has a housing **1**, preferably, but not necessarily, a cylindrical housing, having a bore **2** with a piston **3** slidably mounted within the bore **2**.

The housing **1** has a closed first end **4** containing an aperture **5** through which a cable **6** passes. A first end **7** of the cable **6** is connected to the piston **3**, and a second end **8** if the cable **6** is attached to a holder **9**.

As mentioned above, the housing **1** is capable of substantially retaining a compressed fluid between the closed first end **4** and the piston **3** for at least one oscillation of the piston **3**. A compressible fluid, preferably—but not necessarily—a gas and most preferably—but not necessarily—air, is introduced through a fluid supply valve **10** between the piston **3** and the closed first end **4** of the housing **1**. Of course, if the fluid is air, the fluid supply valve **10** is not necessary, since, during the interval between operation of the ride, air would slowly but sufficiently enter the bore **2** through the aperture **5**. The terminology "closed" with respect to the first end **4** of the housing **1** means, in this document, that such air can leak into the housing **1** but that fluid cannot escape rapidly enough from the first end **4** of said housing **1** substantially to impair the braking action of the fluid upon the piston **3**, *i.e.,* as stated earlier in this paragraph, the housing **1** is capable of retaining a compressed fluid between the closed first end **4** and the piston **3** for at least one oscillation of the piston **3**..

A second end **11** of the housing **1** may be either open or closed.

Also as discussed above, preferably, but not necessarily, an aperture or valve **12** communicating with the atmosphere and with the bore **2** is in a side **13** of the housing **1**.

In an alternate embodiment, which is shown in Figure 2, the cable **6** is continuous. As described above, in this embodiment, the cable **6** exits the housing **1** through the aperture **5** in the closed first end **4** of the housing **1**; re-enters the housing **1** either through the open second end **11** of the housing **1** or, if the second end **11** is closed, through an aperture **14** in the second end **11**; and is attached to the piston **3**. With this embodiment, a first end **15** of a second cable **16** is attached to the cable **6** outside the housing **1**. A second end **17** of this second cable **16** is connected to the holder **9**. In order to reduce friction, a pulley **18** is located outside the housing **1**

near the first end **4** of the housing **1**; and another pulley **19** is placed outside the housing **1** near the second end **11** of the housing **1**. The cable **6** passes around the pulleys **18, 19**.

In either embodiment, when the housing **1** is below the position from which the participant initially begins his or her descent, a pulley **20** is employed to change the direction of force exerted by the piston **3**. In the first embodiment, the cable **6** goes across this pulley **20**; in the second embodiment, the second cable **16** goes across this pulley **20**.

Preferably, but not necessarily, as seen in Figure 3, the Oscillatory Amusement Ride utilizes a single holder **9** but two housings **1**, each having all the components described above with respect to the ride, except, as stated, for the holder **9**.

Preferably, but not necessarily, as depicted in Figure 4, the fluid for each housing **1** is supplied from a common source **21** which can be any source that is well known in the art, such as a tank or a compressor. A separate line **22** goes to each housing **1** and contains a blocking valve **23**.

In the unlikely event that an uncontrolled leak of fluid should arise in a housing **1** between the piston **3** and the first end **4** of the housing **1** the retarding force of the fluid would be less; so , the cable **6** would move more rapidly. A sensor **24** is preferably, but not necessarily, employed to indicate the loss of pressure caused by the escaping fluid. Preferably, but not necessarily, this is done by having a sensor **24** that measures the speed of the pulley **20** associated with each housing **1**, when the housings **1** are located below the position from which the participant initially begins his or her descent.

When the pressure difference between the two housings **1** exceeds a predetermined range, a computer or microprocessor **25** in communication with the sensor **24** and with the blocking valves **23** will cause the line **22** to the housing **1** leaking fluid to close so that the non-leaking housing **1** will not lose fluid and will decelerate the participant.

As indicated previously, preferably, but not necessarily, the participant jumps or falls from a movable platform **26**. The platform **26** can be moved by any means that is well known in the art, such as pneumatics, hydraulics, or an electrical or gas-powered motor. If desired, it could be balanced so that it is normally away from the jump position and must be moved into position.

Preferably, but not necessarily, a sensor **27** in communication with the computer or microprocessor **25** detects whether the platform **26** has been moved from the jump position. The computer or microprocessor **25** is in communication with the fluid supply valve **10** and will not allow additional fluid to be injected into a housing **1** until the platform **26** has been moved away from the jump position. This is intended to preclude a participant from being accelerated upward into the platform **26**.

If desired, fluid can be injected by the fluid supply valve **10** or a separate supply valve **28**, located between the piston **3** and the first end **4** of the housing **1**, slowly into the bore **2** of the housing **1** to raise a participant to the platform **26** prior to the participant's jumping or falling from the platform **26**. Alternatively, the participant could be so raised; and then the fluid supply valve **10** or separate supply valve **28** could permit the fluid between the piston **3** and the first end **4** of the housing **1** to escape so that the participant would fall without ever being on a platform **26**.

Preferably, but not necessarily, the cable **6** (the second cable **16**, in the case of the optional embodiment) is rotatably attached to the holder **9**.

The holder **9** may be either a harness, as shown in Figure 5, or a seat, as depicted in Figure 6.

If the holder **9** is a seat, the center of gravity for the seat **9** is kept a sufficient distance below the point of attachment to the cables **6** (or the second cables **16**, in the case of the optional embodiment) that the seat **9** will not rotate unless a participant rocks it but is also kept sufficiently close to the point of attachment to the cables **6** (or the second cables **16**, in the case of the optional embodiment) that a participant can rock the seat and thereby rotate it. And any means well known in the art, such as a harness or belt, would be used releasably to retain the participant in the seat **9**.

Preferably, as illustrated in Figure 3, the housings **1** and the movable platform **26** are attached to a structural tower **29**.

The Oscillatory Amusement Ride could be fastened to the ground; a permanent structure; or a mobile support, such as a truck or a trailer.

When communication with the atmosphere is mentioned herein, it is sufficient if such communication is with a tank so large that fluid passing through the element communicating

with the tank will not change the pressure within the tank sufficiently as to have an appreciable negative impact upon the operation of the ride.